

Application Serial No.: 09/782,292  
Reply to Office Action dated September 23, 2003

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A plasma display device, comprising:

a plasma display panel comprising a discharge cell including a first electrode and a second electrode; and

a driving unit for driving said discharge cell by giving a potential difference between said first electrode and said second electrode,

wherein said driving unit comprises a pulse generation unit capable of generating a voltage pulse which continuously changes from a first voltage to a second final voltage, and

    said driving unit controls said pulse generation unit to start outputting said voltage pulse as a voltage including said second final voltage to be applied to said first electrode and then to stop the continuous change of said voltage pulse at the point of time when said voltage pulse reaches a third voltage between said first voltage and said second voltage, and

the third voltage is applied to the first electrode at a timing before the second final voltage was to be applied to the first electrode.

Claim 2 (Original): The plasma display device according to claim 1, wherein  
said third voltage is set on the side of said second voltage relative to a firing voltage,  
and

    said voltage pulse reaches said third voltage after a time longer than a discharge delay time passes from the point of time when said voltage pulse exceeds said firing voltage.

Claim 3 (Original): The plasma display device according to claim 1, wherein

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said voltage pulse includes at least one of a CR voltage pulse, a ramp voltage pulse and an LC resonant voltage pulse.

Claim 4 (Original): The plasma display device according to claim 3, wherein said pulse generation unit is capable of generating a rectangular voltage pulse, and said driving unit controls said pulse generation unit to output a voltage pulse in which one of said CR voltage pulse, said ramp voltage pulse and said LC resonant voltage pulse is superimposed on said rectangular voltage pulse, as a voltage to be applied between said first electrode and said second electrode.

Claim 5 (Original): The plasma display device according to claim 1, wherein when one field for image display is divided into a plurality of subfields each including an addressing period and a sustain period set after said addressing period, whether said discharge cell should be illuminated or not in said sustain period is determined in said addressing period and said discharge cell is illuminated in said sustain period if it is determined in said addressing period that said discharge cell should be illuminated, said driving unit starts and stops applying said voltage pulse in a period other than said addressing period and said sustain period in at least one of said subfields in said one field.

Claim 6 (Original): The plasma display device according to claim 5, wherein said driving unit performs, with said voltage pulse, at least one of an operation for generating a discharge in said discharge cell regardless of a display history and an operation

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for generating a discharge in said discharge cell only when said discharge cell is illuminated in the immediately preceding sustain period.

Claim 7 (Original): The plasma display device according to claim 5, wherein  
said driving unit starts outputting said voltage pulse as a voltage to be applied to said  
first electrode before said addressing period, and  
said third voltage of said voltage pulse is set to a value between a ground potential  
and an address voltage applied to said first electrode in said addressing period in determining  
that said discharge cell should be illuminated in said sustain period.

*Bl  
JMT*

Claim 8 (Previously Presented): A plasma display device, comprising:  
a plasma display panel comprising a discharge cell including a first electrode and a  
second electrode; and  
a driving unit for driving said discharge cell by giving a potential difference between  
said first electrode and said second electrode,  
wherein one field for image display is divided into a plurality of subfields each  
including an addressing period and a sustain period set after said addressing period,  
an address voltage is applied to said first electrode and whether said discharge cell  
should be illuminated or not in said sustain period is determined in said addressing period,  
and  
said discharge cell is illuminated in said sustain period when it is determined in said  
addressing period that said discharge cell should be illuminated,  
and wherein said driving unit performs the steps of:

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(a) generating a first voltage pulse having the same polarity as said address voltage has, for generating a discharge in said discharge cell to generate wall charges, and outputting said first voltage pulse as a voltage to be applied to said first electrode; and

(b) generating a second voltage pulse having the same polarity as said first voltage pulse has, for generating a discharge in said discharge cell to control the state of said wall charges, and outputting said second voltage pulse as a voltage to be applied to said first electrode,

both said steps (a) and (b) are performed before said addressing period and said step

(b) is performed after said step (a), and

*B1*  
*CMT*  
said first voltage pulse and said second voltage pulse have waveforms of which absolute values continuously increase toward a predetermined polarity.

Claim 9 (Original): The plasma display device according to claim 8, wherein said driving unit further performs the step of:

(c) generating a third voltage pulse having a polarity reverse to that of said first voltage pulse and outputting said third voltage pulse as a voltage to be applied to said first electrode,

said step (c) is performed between said step (a) and said step (b), and  
said third voltage pulse has a waveform of which absolute value continuously increases toward a predetermined polarity.

Claim 10 (Original): The plasma display device according to claim 8, wherein said driving unit further performs the step of:

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(d) reducing said wall charges in said discharge cell, and  
said step (d) is performed before said step (a).

Claim 11 (Original): The plasma display device according to claim 10, wherein

said driving unit sequentially performs, in said step (d), the steps of:

(d-1) generating a fourth voltage pulse for generating a discharge in said discharge cell and outputting said fourth voltage pulse as a voltage to be applied between said first electrode and said second electrode; and

(d-2) generating a fifth voltage pulse for generating a discharge in said discharge cell and outputting said fifth voltage pulse as a voltage to be applied between said first electrode and said second electrode,

said fourth voltage pulse is a voltage pulse which is capable of generating a discharge at the rise and the fall of said fourth voltage pulse, and

said fifth voltage pulse has a waveform of which absolute value continuously increases toward a predetermined polarity.

Claim 12 (Currently Amended): A plasma display device, comprising  
a plasma display panel comprising a discharge cell including a first electrode and a second electrode; and

a driving unit for driving said discharge cell by giving a potential difference between said first electrode and said second electrode,

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wherein said driving unit generates a discharge in said discharge cell during an operation for defining whether said discharge cell is illuminated for display or not, regardless of whether said discharge cell is illuminated for display or not,

    said driving unit comprises a pulse generation unit capable of generating a voltage pulse which continuously changes from a first voltage to a second final voltage, and

    said driving unit controls said pulse generation unit to start outputting said voltage pulse as a voltage including said second final voltage to be applied to said first electrode, then to stop the change of said voltage pulse at the point of time when said voltage pulse reaches a third voltage between said first voltage and said second voltage and thereafter to perform said operation for defining whether said discharge cell is illuminated for display or not, and

the third voltage is applied to the first electrode at a timing before the second final voltage was to be applied to the first electrode.

*BL*  
*CMK*

Claim 13 (Original): The plasma display device according to claim 12, wherein  
    said plasma display panel comprises a plurality of said discharge cells, and  
    said discharge includes a first discharge and a second discharge weaker than said first  
    discharge,

    said driving unit performs the operations,  
        as said operation for defining whether said discharge cell is illuminated for display or  
        not, of:

        sequentially applying an address pulse to said first electrode of each of said plurality  
        of discharge cells to sequentially select said plurality of discharge cells,

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generating said first discharge in a selected one of said plurality of discharge cells  
when a data pulse is applied to said second electrode of said selected discharge cell, and

generating said second discharge in said selected discharge cell when said data pulse  
is not applied to said second electrode of said selected discharge cell.

*B1d*  
*Cnd*  
Claim 14 (Canceled).